

of its second host—a file-fish (*Balistes*). If the life-history is to be completed, the file-fish must in turn be swallowed by one of the large elasmobranchs, within the body of which the final adult stage is reached, and from thence escape the free-swimming embryos to renew the cycle. In these cases, however, where all runs smoothly—for the parasite—no pearls are formed. On the other hand, when the oyster escapes the file-fish, the larval parasite, unable to complete its development, dies, and becomes encapsuled by the pearly nacre deposited by the living tissues of the oyster upon the source of irritation.

Throughout his report Prof. Herdman bestows unstinted praise on the work of his assistant, Mr. Hornell, and there can be no doubt but that it is most thoroughly deserved, for much work of the highest importance was entrusted to him, and he in every case proved worthy of the trust. We are therefore glad that Prof. Herdman's wish has been fulfilled—

will be read with great interest. No less than seven of the eleven species known occur around Ceylon. "The tables at the end of the report show how extremely variable the species of the group are, and the more extended our knowledge of this group becomes the less do the species appear to be separated." The report on the Copepoda, by Messrs. Thomson and Scott, is by far the largest of these supplementary reports, and embraces descriptions of no less than 283 species, of which 76 are new to science.

Further description of this most valuable book we cannot give. It must be read to be appreciated. The vast wealth of information contained in Prof. Herdman's report on the pearl oyster alone demanded far more space than we have been enabled to afford it. Enough, however, has probably been said to show that the commission was not only completely justified, but has resulted in a rich harvest of facts which appeal not merely to those interested in the pearl fisheries or to students of mollusca, but to the biologist the world over.

The volume is well bound, well printed, and profusely illustrated.  
W. P. P.

#### THE CAMPAIGN AGAINST MALARIA.<sup>1</sup>

THE unhealthiness of many tropical countries is largely due to the prevalence of malarial diseases. The discovery that a particular kind of mosquito is the definitive host of the malaria parasite paved the way for a method of prevention based upon the destruction of the malaria-bearing mosquitoes, which, so far as present knowledge goes, all belong to the genus *Anopheles*. At first the measures of prevention were individual rather than general, and included the destruction of mosquitoes in and about the house, and their exclusion by nets and wire gauze. But through the labours of Major Ronald Ross on the west coast of Africa, and of the Americans in Cuba and elsewhere, it has been shown that much may be done to free a whole town from mosquitoes, thereby diminishing the incidence of malaria.

The report under review details the measures initiated in India by the members of the Royal Society's Malaria Commission to test the efficacy of mosquito destruction in the prevention of malaria. The station selected was Mian-Mir, a cantonment near Lahore, the garrison of which consists of about 3900 officers and men, British and native, and of 600 native followers. Situated in a plain with an average rainfall of about 20 inches, little of the surface water can drain away, especially as the subsoil is exceedingly impervious, so that after one or two hours' rain the locality becomes flooded. In addition there are numerous brick-work surface drains, which become filled and form excellent breeding-places for the *Anopheles* until dried up by the sun. Owing to these conditions, Mian-Mir is one of the most unhealthy cantonments in India, the mean annual admission rate for ague among European troops averaging 663 per 1000. Six species of *Anopheles* were found to be present, of which *A. Rossii* was the most abundant, the numbers reaching a maximum in September and October.

The methods of prevention adopted were (1) the cleaning of irrigation water courses, smoothing their sides, and where possible lining with brick and cement; (2) drying out and cleaning branch water courses every ten days; (3) treatment of water courses with kerosene oil; (4) draining small collections of stagnant water;

<sup>1</sup> "The First Report of the Anti-malarial Operations at Mian-Mir, 1901-1903." By Capt. S. P. James, I.M.S. (*Scientific Memoirs of the Government of India*, No. 6. Calcutta, 1903.)

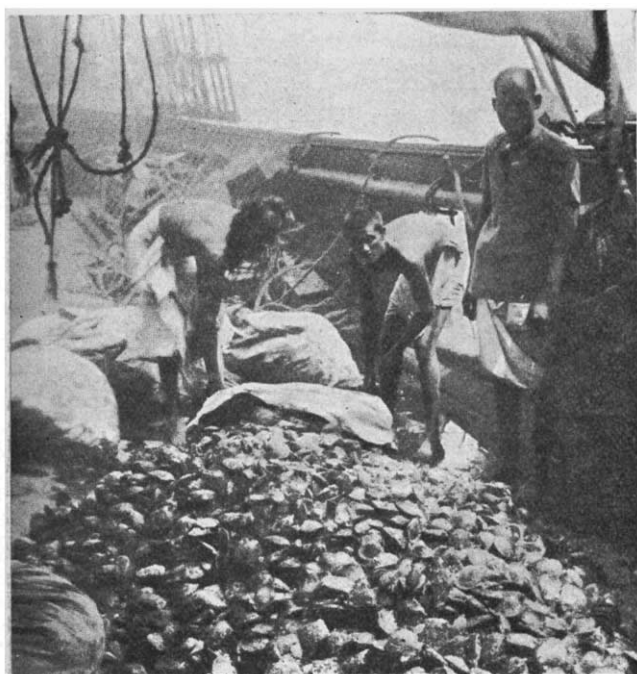


FIG. 2.—Valuation sample of pearl oysters from the Cheval Paar, being brought on board the *Rangasametporawee* from the inspection boats. From a photograph by J. Hornell.

that Mr. Hornell should be asked to continue his observations as marine biologist at the Galle Laboratory—for he will now be able to render "signal service to the pearl, sponge, trepang and other marine fisheries of the Colony."

In concluding this notice we must not omit to mention that a series of separate reports has been prepared by various specialists on material collected during this investigation. Seven of these reports are included in the present volume, and others are to follow. The first of these deals with the geology of the sea-bottom, and describes the formation of the peculiar bottom essential to the presence and well-being of the pearl oyster. Mrs. Gepp, in an account of the algæ collected, describes the hitherto unknown fructification of a species of *Halimeda*.

The remaining reports are zoological, and describe the Gephyrea, Chitons, Holothurians, Cephalochorda, and Copepoda. Mr. Tattersall's report on *Amphioxus*

(5) constant attention to collections of water in gardens of houses and bungalows. In addition the segregation of Europeans was carried out to a limited degree, removing them from the vicinity of infected natives, treatment of all infected persons with quinine and the prophylactic use of quinine, the troops being paraded twice a week for this purpose. The results obtained were a distinct but not great diminution in the number of *Anopheles* present in the houses, and a diminution in the admission rate for ague to 269 per 1000, the lowest rate on record (1902 happened to be, however, an exceptionally healthy year). Captain James concludes that mosquito destruction, even though not obviously reducing the number of *Anopheles*, brings about a decrease in the amount of malaria, but is difficult to carry out and is expensive; apparently the campaign against the mosquitoes at Mian-Mir was not nearly so successful as that in Lagos. He attributes great value to the other measures, viz. the continued and systematic treatment with quinine of the native children, who are undoubtedly the chief source of infection, and the prophylactic use of quinine.

R. T. HEWLETT.

#### M. HENRY PERROTIN.

THE cause of astronomical science in France has been deprived of another of its ablest advocates by the lamented death of M. Perrotin, the director of the observatory at Nice. For more than twenty years M. Perrotin has watched over the growth and directed the energies of that institution. It was his good fortune, through the munificence of M. Bischoffsheim, to be able to erect and arrange a well equipped observatory to his own design, unhampered by legacies from former benefactors or directors. How the work grew under his hand astronomers have long since recognised and appreciated. As each instrument was completed it was immediately devoted to some special purpose. The meridian instrument was employed to determine the difference of longitude between Paris and the observatory, and to complete the chain Paris-Nice-Milan long before the observatory was in working order as a whole. The fifteen-inch equatorial was at work on double stars, planetary markings, comets, &c., before the large instrument of thirty inches aperture, under the mammoth "floating dome," could be devoted to the more rigorous scrutiny of faint and difficult objects.

It is scarcely necessary here to direct attention to the industry that marked the career of the first director of the Nice Observatory, or to the value of the researches produced by the staff under his guidance and encouragement. The work of M. Thollon on the solar spectrum may serve as a specimen in the department of spectroscopy. The discovery of many minor planets shows the care with which the photographic plates were taken and scrutinised. More particularly as the work of M. Perrotin, personally, should be mentioned his discussion of the inequalities in the orbit of Vesta, a research to which he devoted much time, interrupted as it must frequently have been by the care of the establishment under his charge. As an observer he was indefatigable, and devoted much time to the study of the faint markings on Venus, on Mars, and on Uranus. Aware that he was working at the extreme limit of visibility, and knowing the tendency for self-deception to creep in and impair the value of such delicate observations, he sought opportunities of making similar measures and records with different instruments, and under varied conditions, in order to remove, so far as possible, the evils of bias and partiality from the results of his researches. Excessive

and painstaking care marked his efforts to secure rigorous accuracy.

Apart from his astronomical work, properly so called, in the department of physics, he added another determination to those that have been made on the velocity of light, which we recall here mainly to show the varied character of his researches and the energy which he displayed in whatever he undertook. His life was a busy one, and he did not spare himself. The great monument that he has left behind is the magnificent observatory at Mont Gros, and his greatest service to science is perhaps the activity which he inspired in those by whom he was surrounded. At the comparatively early age of fifty-eight he has succumbed, but he leaves behind him a memory that will be long treasured by all those whose fortune it has been to assist him in earning the reputation that the young observatory at Nice has already won.

#### NOTES.

THE Croonian lecture of the Royal Society will be delivered on March 24, the subject being "The Chemical Regulation of the Secretory Process," by Prof. E. H. Starling, F.R.S., and Dr. W. M. Bayliss, F.R.S. The Bakerian lecture will be delivered during May by Prof. E. Rutherford, F.R.S., of Montreal, on "The Succession of Changes in Radio-active Substances."

THE annual inspection of the National Physical Laboratory by the General Board will be held to-morrow, March 18.

PROF. OSTWALD will deliver the Faraday lecture of the Chemical Society on April 19 in the theatre of the Royal Institution.

PROF. AGASSIZ has been elected a foreign associate of the Paris Academy of Sciences in succession to Sir George Stokes; and Prof. E. Warming, Copenhagen, has been elected a correspondant of the academy.

SIR ARTHUR RÜCKER will deliver the academic address at the close of the present session at the University College of North Wales, Bangor.

DR. ROBERT LUTHER has been appointed professor of physical chemistry at the University of Leipzig.

THE deaths are announced of Dr. Wilhelm Schnell, professor of mechanics and synthetic geometry at the Technical School of Karlsruhe, and of Dr. von Pallich, assistant in physics and director of the meteorological station at the University of Graz.

THE Belgian Royal Academy has awarded its gold medal of 1000 francs to M. Marc de Selys-Longchamps for his memoir on the development of a *Phoronis*. The Théophile Gluge prize for physiology has been awarded to Dr. P. Nolf, of the University of Liège.

THE following have been elected associates of the Belgian Royal Academy (*Classe des Sciences*):—Prof. George Howard Darwin (England), Corrado Segre (Turin), Wilhelm Roux (Halle-sur-Saale), and M. Michel Lévy, of the French Geological Survey.

THE foundation of Schnyder von Wartensee offers, says *Science*, its prize of about 140*l.* for an essay on the climate of Switzerland during the last thirty-seven years. Essays, which may be in English, should be sent before September 30, 1906, to the library at Zurich.

A REUTER message from Rome reports that at 5.30 a.m. on March 10 a very violent earthquake shock, followed by four others, was felt at Magliano di Marsi. On the same